Louisiana Office of Public Health Laboratories	
Test Name	AST, ALT, Total Bilirubin, Creatinine, Uric Acid
PHL Location	Central Laboratory (To be referred to LabCorp)
CPT Code	AST: 84450 ALT: 84460 Bilirubin, Total: 82247 Creatinine: 82565 Uric Acid: 84550
Synonyms	AST = SGOT, ALT = SGPT
Brief Description of Test	AST – Aspartate aminotransferase is present in high activity in heart, skeletal muscle, and liver. Increased serum AST activity commonly follows myocardial infarction, pulmonary emboli, skeletal muscle trauma, alcoholic cirrhosis, viral hepatitis, and drug-induced hepatitis. ALT – Alanine aminotransferase is present in high activity in liver, skeletal muscle, heart, and kidney. Serum ALT increases rapidly in liver cell necrosis, hepatitis, hepatic cirrhosis, liver tumors, obstructive jaundice, Reye's syndrome, extensive trauma to skeletal muscle, myositis, myocarditis, and myocardial infarction. Bilirubin, Total – Total bilirubin in serum and plasma is the sum of unconjugated bilirubin (Bu), mono- and di-glucuronide conjugated bilirubin (Bc), and delta bilirubin (DELB), a bilirubin fraction covalently bound to albumin. With the exception of anicteric jaundice, total serum bilirubin is invariably increased in jaundice. Causes of jaundice are prehepatic, resulting from various hemolytic diseases; hepatic, resulting from hepatocellular injury or obstruction; and posthepatic, resulting from obstruction of the hepatic or common bile ducts. Creatinine – Serum creatinine excretion is a function of lean body mass in normal persons and shows little or no response to dietary changes. The serum creatinine concentration is higher in men than in women. Serum creatinine is increased in acute or chronic renal failure, urinary tract obstruction, reduced renal blood flow, shock, dehydration, and rhabdomyolysis. Causes of low serum creatinine concentration include debilitation and decreased muscle mass. Exercise may cause an increased creatinine clearance. Uric Acid – Uric acid is the end product of purine metabolism. Elevations of uric acid occur in renal failure, prerenal azotemia, gout, lead poisoning, excessive cell destruction (e.g., following chemotherapy), hemolytic anemia, and congestive heart failure and after myocardial infarction. Uric acid is also increased in some endocrine disorders, acidosis, toxemia of pregnancy, hereditary gout, and glycogen storage disease type I. A low uric acid concentration may be found following treatment by some drugs (e.g., low-dose aspirin), with low dietary intake of purine, in the presence of renal tubular defects, and in xanthinuria.

<table>
<tr><td>Possible Results</td><td>AST, ALT – reported in International Units per Liter, IU/L

Total Bilirubin, Creatinine, and Uric Acid – Reported in milligrams per deciliter, mg/dL</td></tr>
<tr><td>Reference Range</td><td>Reference range for test, may be broken out into age, sex or racial

Groups. For qualitative tests may be present or absent.

<table>
<tr><th colspan="2">Normal Range</th></tr>
<tr><td>AST:</td><td>0-40 IU/L</td></tr>
<tr><td>ALT:</td><td>Males: 0-44 IU/L Females 0-32 IU/L</td></tr>
<tr><td>Bilirubin, Total:</td><td>0.0-1.2 mg/dL</td></tr>
<tr><td>Creatinine:</td><td>Males:0 .76-1.27 mg/dL Females: 0.57-1.00 mg/dL</td></tr>
<tr><td>Uric Acid:</td><td>Age >18 Males: 3.7-8.6 mg/dL Female: 2.5-7.1 mg/dL</td></tr>
</table></td></tr>
<tr><td>Specimen Type</td><td>Serum specimens are approved to be tested by this method.</td></tr>
<tr><td>Specimen Container(s):</td><td>Serum: Regular clot separation tube, separate serum within 45 minutes of collection.</td></tr>
<tr><td>Minimum volume accepted:</td><td>0.5 ml</td></tr>
<tr><td>Collection Instructions</td><td>Blood should be collected in plastic, sterile Vacutainer tube, allowed to clot for 30 minutes, and centrifuged at 1000-1300g within 45 minutes. Pour off into cyro-tube for shipping. Do not ship in the gel separator tube.

Specimen labels and Specimen containers must be labeled with at least 2 identifiers:
• Patient's name
• Unique identifier

Required information for specimen submission:
• Patient's name
• Unique identifier
• Date of birth/age
• Date and time of collection
• Initials of the person who collected the specimen
• Source of the specimen, (Serum)
• Submitter name, address, and contact number</td></tr>
<tr><td>Storage and Transport Instructions</td><td>
<table>
<tr><th>Analyte</th><th>Room Temp

(18°-28°C)</th><th>Refrigerated

(2°-8°C)</th><th>Frozen

(</-20°C)</th></tr>
<tr><td>ALT</td><td>Unacceptable</td><td></= 14 days</td><td>Unacceptable</td></tr>
<tr><td>AST</td><td>Unacceptable</td><td></= 14 days</td><td></= 14 days</td></tr>
<tr><td>Bilirubin, Total</td><td>Unacceptable</td><td></= 3 days</td><td></= 14 days</td></tr>
<tr><td>Creatinine</td><td>Unacceptable</td><td></= 14 days</td><td></= 14 days</td></tr>
<tr><td>Uric Acid</td><td>Unacceptable</td><td></= 14 days</td><td></= 14 days</td></tr>
</table></td></tr>
</table>

	Package in special thick-walled small volume OPH cooler and sandwich samples between low-temperature freezer packs. Ship rapidly so as to guarantee arrival at a temperature of 2^{o} – 8^{o} C. Sample arrival at the laboratory from time of collection must be well before the shortest storage time listed for the analyte(s) of interest. Samples shipped frozen must be received at a temperature of -20°C or colder.
Causes for Rejection	Sample hold time exceeded (age), elevated temperature upon arrival, hemolysis, QNS, transit damage, improper sample, leaking specimen tube, hemolysis ≥ 100 mg/dL hemoglobin (by color) and lipemia (≥250 mg/dL intralipid).
Limitations of the Procedure	All clinical chemistry results are subject to evaluation and interpretation by a medical professional. All aspects of the patient's history, symptoms, and other diagnostic testing must be considered along with the serum chemistry in actual patient monitoring and treatment. This testing is only a part of the entire picture.
Interfering Substances	AST – Hemolysis falsely elevates AST results. Hemolyzed specimens should not be used. Triglycerides at 3000 mg/dL [33.9 mmol/L] increase AST results by 44% at 37 U/L AST activity. ALT – Total Protein at 12 g/dL [120 g/L] decreases ALT results by 12 % at an ALT activity of 50 U/L. Total Bilirubin – Samples must be protected from light and excessive heat. Levodopa, 4-aminosalicylic acid, phenazopyridine, biliverdin, hemoglobin @ 1-4g/L all are capable of introducing biases into the results. Neonates <14 days old should not be tested with the Tbil slide. Elevation greater than 6000' above sea level may produce inaccurate results. Pansporin shows a very large positive bias. Misc. compounds that absorb light around 555 nm may contribute interferences. Creatinine – Antibiotics containing cephalosporin lead to significant false-positive values if samples are drawn within four hours of a dose. With severe renal disease, creatinine is not reliable in the presence of cefoxitin therapy. There is less interference reported from the cephalosporins cephalothin, cephaloridine, cephadrine sodium, and cephaloglycin dihydrate. Lipemia, hemolysis, and bilirubin may interfere. Glucose – Hemolysis may contribute a +/- 10% bias to results depending upon sample age and catalase activity. Heavily lipemic samples must be diluted before analysis. Uric Acid – Xanthine has been reported to decrease the URCA result by 40%.8• Formaldehyde (formalin) has been reported to give negative interference with the uricase methods.
References	LabCorp On-line Specimen Submission Test Menu. • AST – Test No. 001123 • ALT – Pub Test No. 001545 • Total Bilirubin (TBIL) – Test No. 001099 • Uric Acid – Test No. 001057

	• Serum Creatinine – Test No. 001370
Additional Information	None
Release Date	3/2016
Warning: If you have printed a copy of this information please be advised that the Louisiana Office of Public Health Laboratories website and methods are updated on a regular basis. Please check the on-line version of this document to ensure you are relying on the most recent release.	